HOLUX GR-230

Bluetooth **GPS Receiver**

User's Guide

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1. Overview

(Fig.1)

The ***HOLUX*** **GR-230** Smart **wire-less Bluetooth GPS Receiver** (Fig. 1) is a total solution GPS receiver with Bluetooth, UART interface and built-in rechargeable battery for high sensitivity to tracking signal. GR-203 design is based on SiRF Star IIe/LP low power Architecture.

GR-230 is a dual-function GPS receiver. Not only transmit satellite information through the PDA or Notebook with Bluetooth interfaces but also is a G-Mouse GPS receiver through a data cable to deliver satellite signal to the device without Bluetooth interface.

This positioning application meets strict needs such as car navigation, mapping, surveying, security, agriculture and so on. Only clear view of sky and certain power supply are necessary to the unit. GR-230 contacts to other device through Bluetooth device, compatible interface of RS-232 or USB, and built-in recharge battery to save satellite information such as the status of satellite signal, the last location, date and time of last use.

With low power consumption, the GR-230 tracks up to 12 satellites at a time, re-acquires satellite signals in 100 ms and updates position data every second. Trickle-Power allows the unit operates a fraction of the time and Push-to-Fix permits user to have a quick position fix even though the receiver usually stays off.

2. Packing List

Congratulations on your purchase of the GR-230 GPS Receiver. We hope it will be useful to you for a long time. Before you begin, make sure that your package includes the following items. If any of these items are missing, please contact your local HOLUX dealer or distributor.

- HOLUX GR-230 Bluetooth GPS receiver 1 Set
- Travel power supply / Cigarette adapter 1 Set
- AC Multi Power Plug Adapter 1 Set
- Manual and Driver CD 1 Piece
- GR-230 Quick guide 1 Piece
- Warranty card 1 Piece

3. Main functions

GR-230 provides a series of functions. It is well suited to system integration and users who use PDA, Notebook PC with Bluetooth device。

- Built in SiRF Star IIe/LP Low power consumption chipset。
- 12 parallel satellite-tracking channels for fast acquisition and reacquisition。
- High speed signal acquisition using 1920 time/frequency search channels。
- Built-in WAAS/EGNOS Demodulator without additional any hardware。
- Compatible with Bluetooth Serial Port Profile (SPP) completely。
- Built-in rechargeable Lithium-ion battery without external power supply。
- Provide Continue mode and Power saving mode for user's requirement。
- Provide expand terminal contact to other system without Bluetooth device。
- Built-in rechargeable battery for memory and RTC backup and for fast Time To First Fix (TTFF)。
- Support NMEA0183 v2.2 data protocol and SiRF binary code。
- 4 colors LED to show the status of device。
- Active antenna connector for getting better satellites signal。
- FLASH based program memory. New software revisions upgradeable through serial interface。
- Small, sleek, and lightweight design easily fits in your hand。
- Enhanced algorithms -SnapLock and SnapStart provide superior navigation, performance in urban, canyon and foliage environments。
- For Car navigation, Marine navigation, Fleet management, AVL, Personal navigation, Tracking System, and Mapping device application。

4. Technical Specification

4.1. Basic Specification

- Chipset：SiRF Star IIe/LP chipset.
- Channels： 12 parallel satellite-tracking channels.
- Frequency： 1575.42 MHZ.
- Receiver： L1, C/A code.

4.2. Acquisition Time (averaged)

- Reacquisition： 0.1sec.
- Snap start： < 3 seconds (at < 25 minutes off period)
- Cold start： < 45 seconds.
- Warm start：< 38 seconds .
- Hot start： < 8 seconds
- Update rate： 1 second continuously

4.3. Receiver Accuracy

- Normal： 5-25 meters CEP without SA.
- Enable EGNOS or WAAS：
  Position: < 2.2 meters, horizontal 95% of time。
  < 5 meters, Vertical 95% of time。
- Velocity： within 0.1 meters / second。
- Time： 1 microsecond synchronized GPS time。

4.4. Use Limitation

- Altitude： < 18,000 meters (60,000 feet) 。
- Velocity: ：< 515 meters / second (700Knots) 。
- Acceleration： 4 G.
- Jerk： 20 meters / second, max

4.5. Power Supply

- External Voltage: 5VDC +/- 10%
- Batteries：
  Main Power: Built-in rechargeable Lithium-ion for system power.
  Backup Power: Rechargeable Lithium-ion battery for memory & RTC backup.
- Working voltage: 80-90mA (Normal mode).
  30mA (Power Saving).
- Working period (In Battery full power status):
  > 9 hours on Continue mode.
  > 16 hours on Power Saving mode.

4.6. Output and Interface

- **Output**

I. Output protocol

Baud Rate： 9600 bps

Data bit： 8

Parity： No

Stop bit： 1

II. Format. NMEA0183 V2.2： GPGGA (1time/1 sec), GPGSA (1 time/1 sec.), GPGSV (1time /5 sec.), GPRMC (1time /1 sec.), (GLL, VTG or SiRF binary format for optional).

III. Datum： WGS84.

- **Input/ Output Interface:**

I. Compatible Bluetooth Serial Port Profile (SPP), Version1.1 and class 2(up to 10 meter range).

II. In/Out Port. GPS signal (Out)/Command(In) with CMOS/TTL Level。Mini USB Type B Connector and Cable option：

(a) GR230-A1(RS232 data cable)

(b) GR230-A2 (USB data cable)

(c) GR230-A3 (Mini USB port to PS2 port).

- **External Antenna interface:**

3.0V input MCX type active antenna connector。

4.7. Physical

- Size： 72 × 55 × 21 mm。
- Weight： < 75 g 。
- Operating Temperature： -10 ℃ to + 60 ℃
- Storage Temperature： -20 ℃ to + 85 ℃
- Operating humidity： 5% to 95% No condensing。

4.8. Other Functions

- Bluetooth frequency: 2.4 ~2.48GHZ。
- Bluetooth Input Sensitivity: -80dbm。
- Low sensitivity of receiving satellite signal ： -175dBW。
- LED Functions： Indicate Bluetoothh status, GPS status, Battery Status and Battery charging status。

5. Getting Started

STEP 1. Charge Battery

Please charge battery till LED off for the first time.

Power cable plug in Power cable connect to power socket

↓

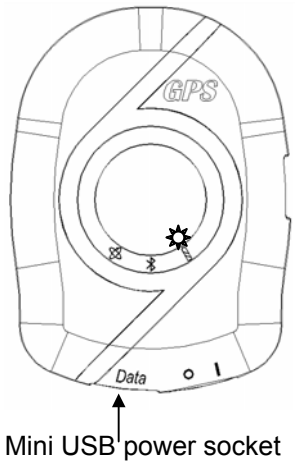
Charge Battery

Battery indicator light:

Power too low -------- red LED

Charging ---------- green LED

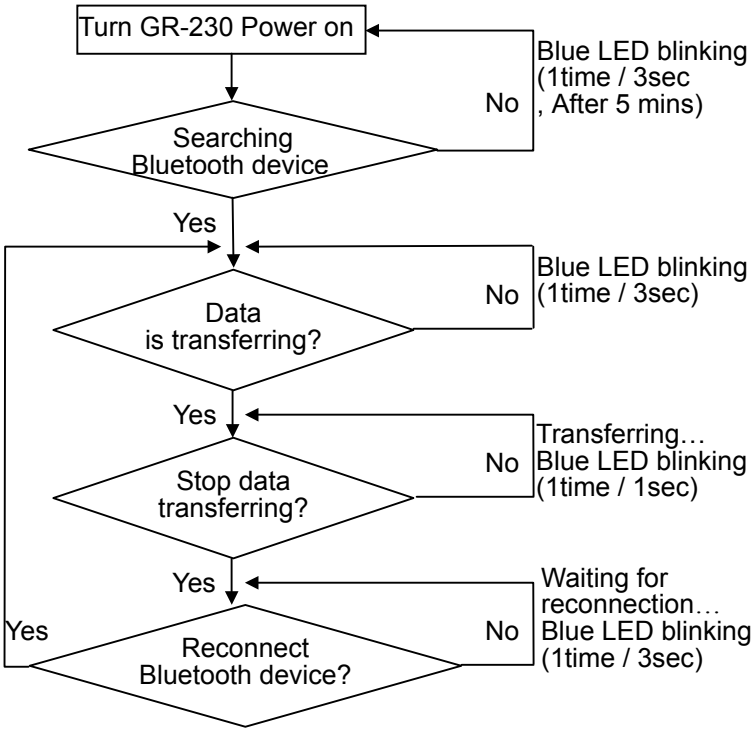
Full or Not in charging -- LED off

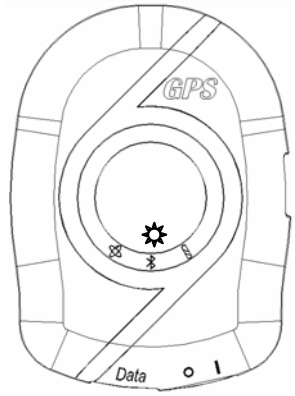


Mini USB power socket

STEP 2. Turn on Power

Bluetooth Status –





Note:
Some PDAs have to re-open Bluetooth manager for Bluetooth device re-connection.

GPS Status ---

Put GR-230 in clear view of the sky without any obstruction for better satellite acquiring.

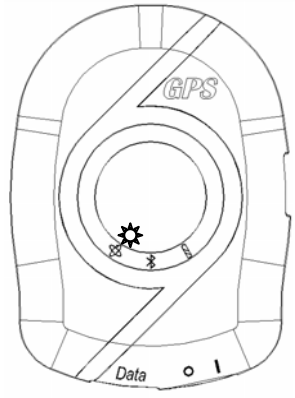
Turn on Power of GR-230

↓

Search GPS -------- steady orange LED on

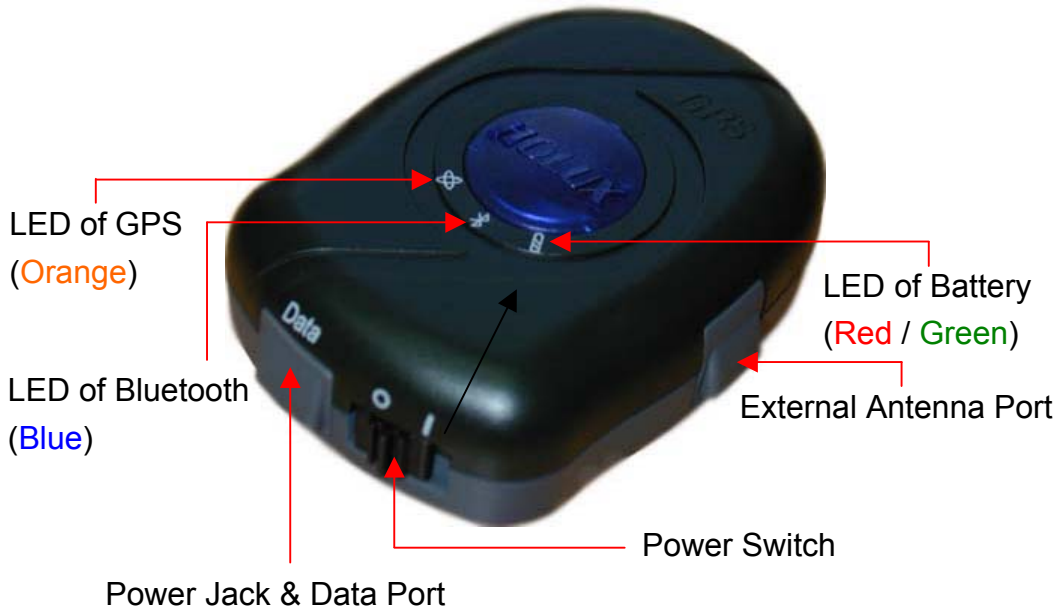
↓

Position Fixed ------ orange LED blinking



5.1. Hardware Description

1). GR-230 Body description see Fig. 2:



(Fig.2)

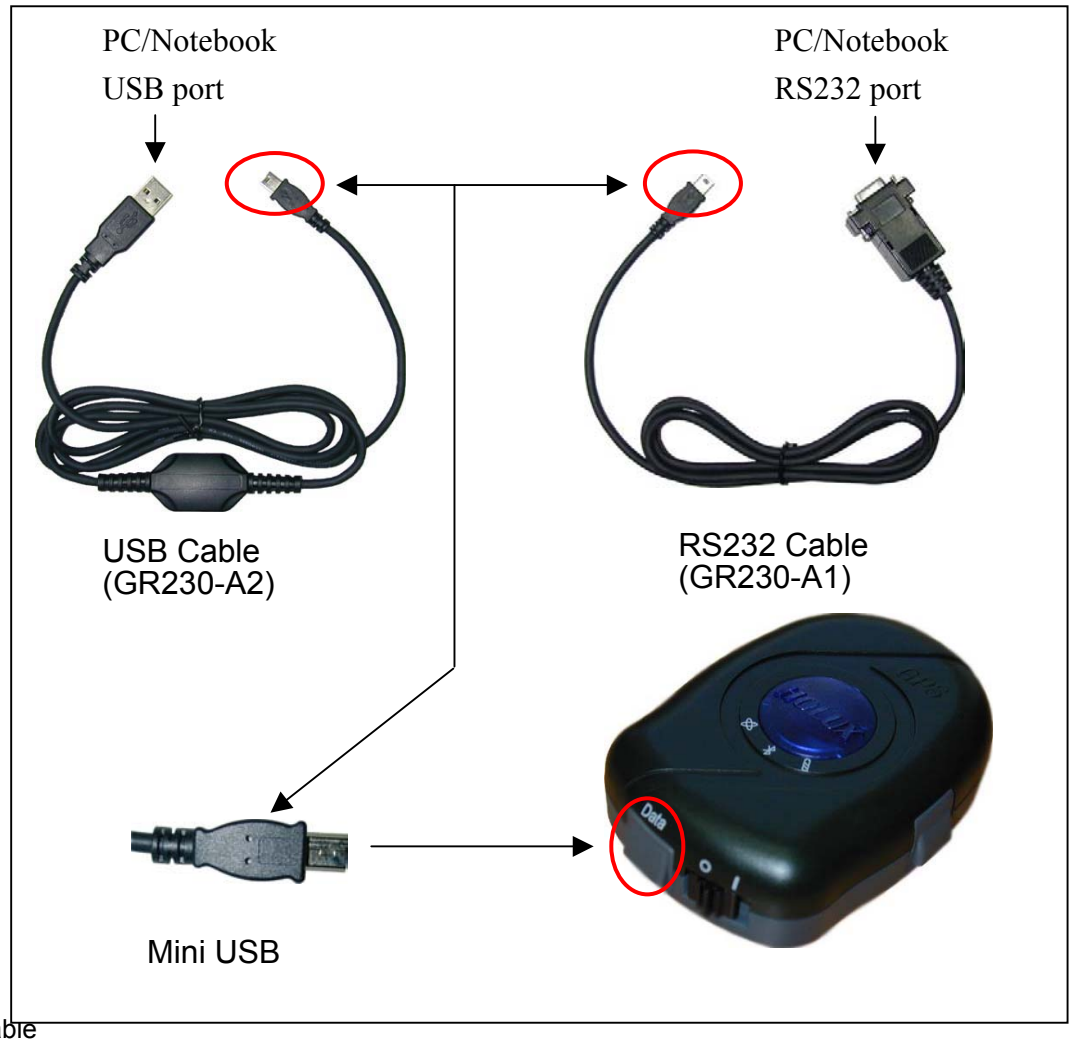
2). LED status :

SYMBOL	COLOR	STATUS		DESCRIPTION
Bluetooth	Blue	Blinking	3 times / 1 sec	Search Bluetooth Device
			1 time / 3 sec	Standby Mode
			1 time / 1 sec	Transferring Data
Battery	Red	Light on		Power too low
	Green	Light on		In charging
	N/A	Light off		Battery full or Not in charging
GPS	Orange	Light on		Acquiring Satellites
		Blinking		Position Fixed

3). Power Switch :

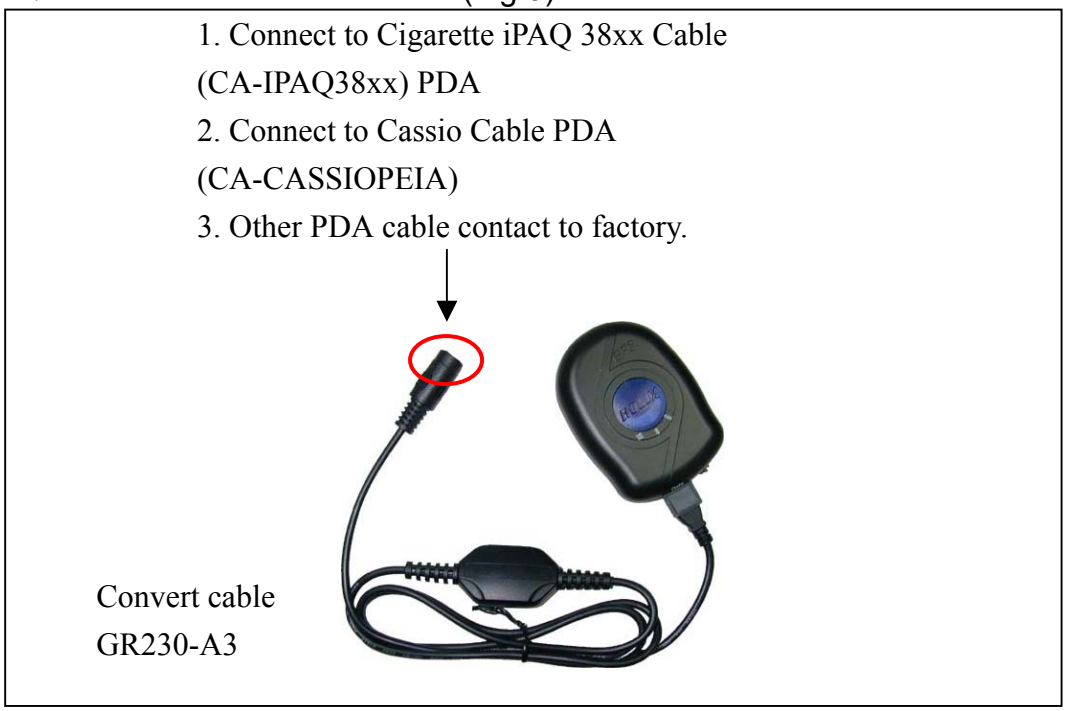
1 : Power on
0 : Power off

4). Optional accessories, and connector description, see Fig. 3 and Fig. 4。



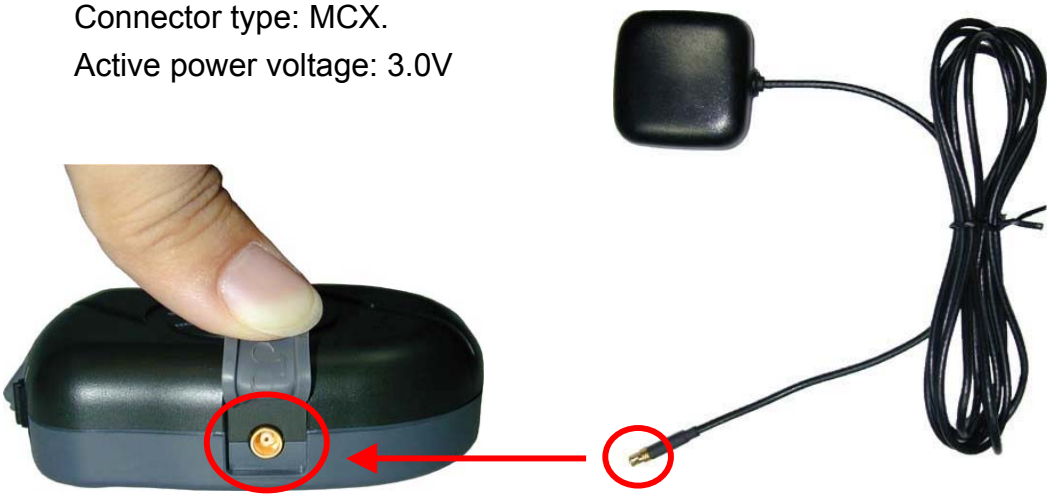
USB Cable
(GR230-A2)

(Fig.3)



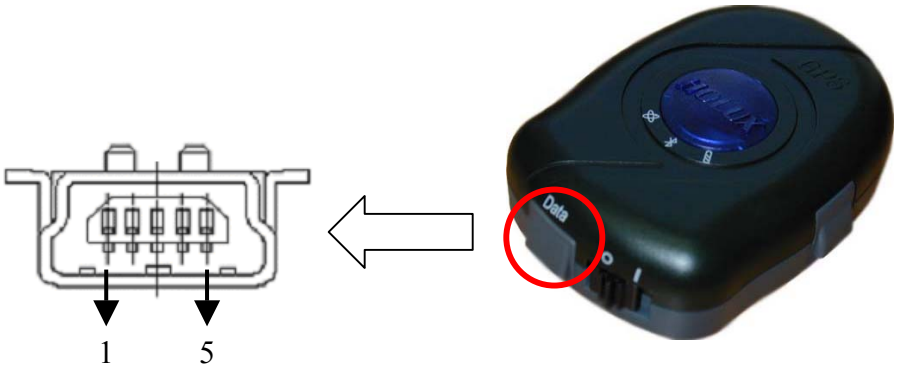
(Fig.4)

3) External active antenna connector, see Fig. 5。
Connector type: MCX.
Active power voltage: 3.0V



(Fig.5)

4) Power Jack & Data Port, see Fig. 6。
Jack type: Mating face of 5 pin Mini USB Type B female。
Pin definition see table 1。



(Fig.6)

Table 1

Pin	Pin Name	Signal and description
1	GND	Signal ground, Battery charging ground.
2	VOUT	Unregulated voltage out: 3.6 V max 100mA.
3	TXD	Transmit Data. From organizer to peripheral.(Voltage Level is 3.3V ~ 5.0V).
4	RXD	Receive Data. Form peripheral to organizer.(Voltage level is 3.3V ~ 5.0V).
5	VCHARG	Positive terminal of DC adaptor that powers the internal charging circuit of Li-Ion battery. The approved power supply is 5.0V +/- 5%@1A.

5.2. Software Installation

The following is the steps of software installation to setup on PDA, DELL AXIM with Bluetooth Manager. For other PDA, the steps may be a little different.

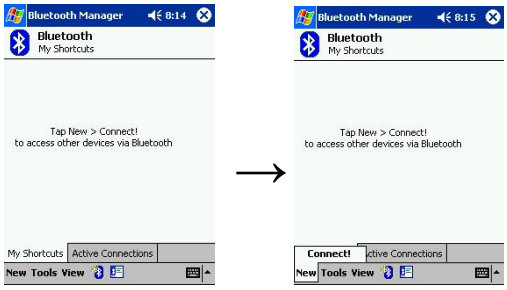
(Bluetooth Manger is one of popular program used for Bluetooth device)

1. Open "Bluetooth Manager" on pocket pc.

New

↓

Connect



2. Search Bluetooth device "HOLUX GR-230"

Select Explore a Bluetooth device

↓

Next

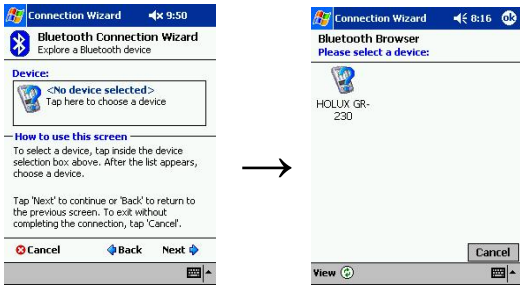
Connection Wizard
Bluetooth
Explore a Bluetooth device
Discover the services another device offers and create connection shortcuts for them.
Connect to the Internet
Access the Internet using a network access point, a cell phone or another connected Bluetooth device.
Join a personal network
Connect two or more Bluetooth devices to share files, collaborate or play multiplayer games.
Partner with a cell phone
Cancel
Next

3. Find the Bluetooth device

Next

↓

Tap HOLUX GR-230



4. Connect to SPP Slave

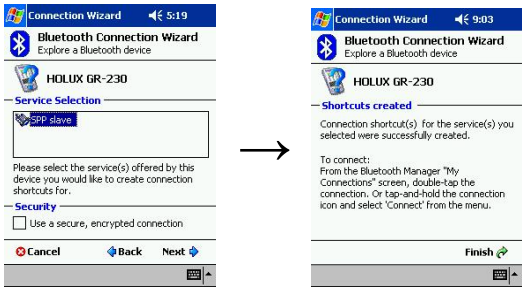
Select SPP slave

↓

Next

↓

Finish


Connection Wizard
Bluetooth Connection Wizard
Explore a Bluetooth device
HOLUX GR-230
Service Selection
SPP slave
Please select the service(s) offered by this device you would like to create connection shortcuts for.
Security
Use a secure, encrypted connection
Cancel
Back
Next
Shortcuts created
Connection shortcut(s) for the service(s) you selected were successfully created.
To connect:
From the Bluetooth Manager "My Connections" screen, double-tap the connection. Or tap-and-hold the connection icon and select 'Connect' from the menu.
Finish

6. 5. Finish Bluetooth Manager Setup

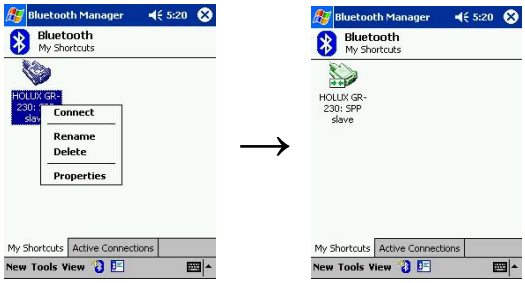
Tap and Hold HOLUX GR-230: SPP slave

↓

Connect

↓

Finish Bluetooth setup (opposite arrow is displayed)



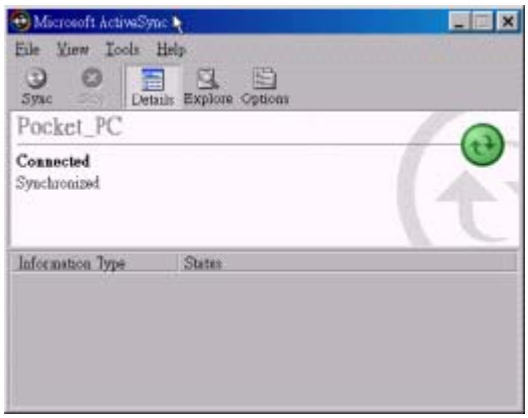
5.3. Installation of testing program

(GPSViewer.exe is compatible with Microsoft Pocket PC or other operation system alike.)

1). Install Microsoft ActiveSync to your PC, refer to your Pocket PC manual for installation procedure, as Fig. 5.

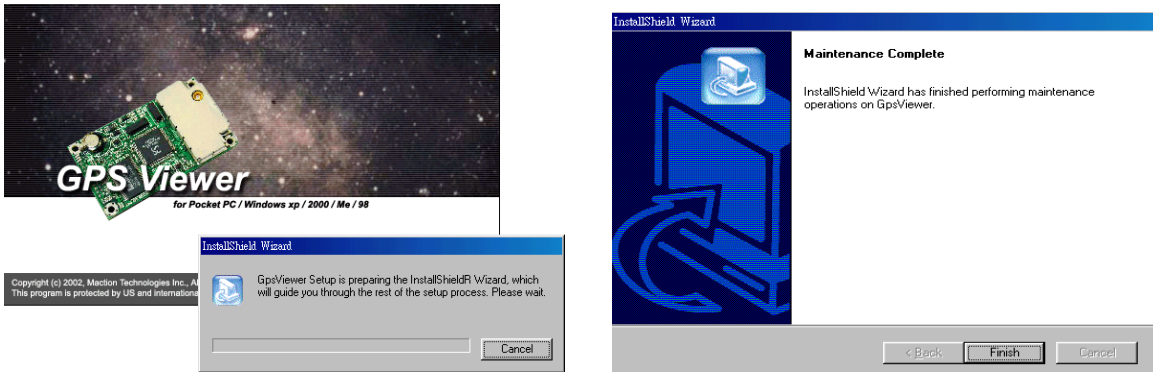
2). Setup your Pocket PC cradle to Desktop PC UART port. The Microsoft ActiveSync will detect your Pocket PC automatically.

Setup your Pocket PC cradle to Desktop PC UART port. The Microsoft ActiveSync will detect your Pocket PC automatically, as Fig. 7.



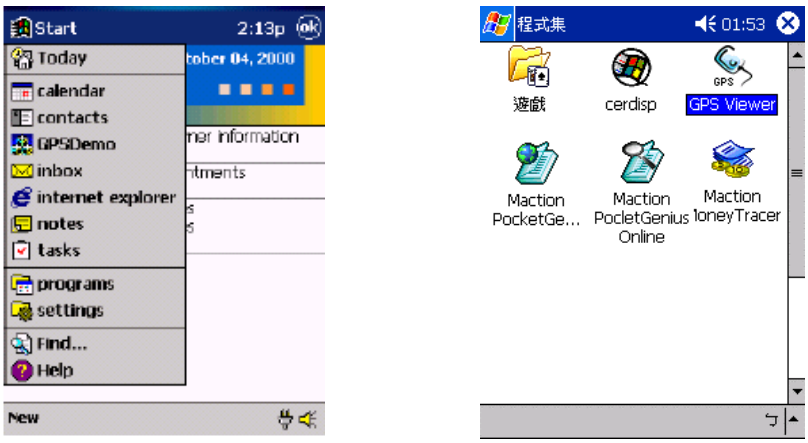
(Fig. 7)

3). Double click the GPSViewer.exe on your PC, then Holux GPSViewer.exe program will install automatically, as Fig. 8.


GPS Viewer
for Pocket PC / Windows xp / 2000 / Me / 98
InstallShield Wizard
GpsViewer Setup is preparing the InstallShield® Wizard, which will guide you through the rest of the setup process. Please wait.
Cancel
InstallShield Wizard
Maintenance Complete
InstallShield Wizard has finished performing maintenance operations on GpsViewer.
< Back
Finish
Cancel

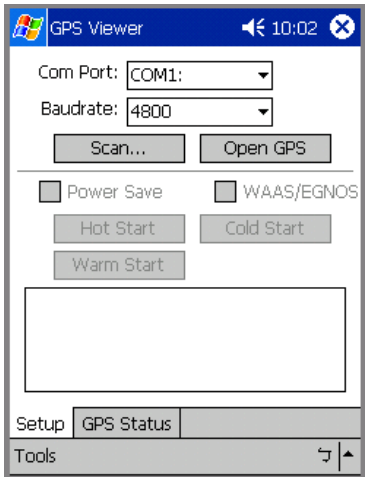
(Fig. 8)

4) Push “Start”→ “Programs”→ “GPSViewer” on PDA, as Fig. 9.



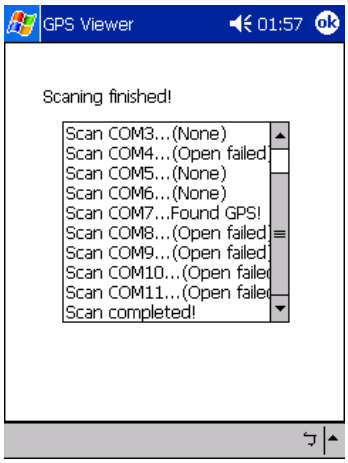
(Fig. 9)

5) The following window is show after executing GPSViewer, as Fig. 10.

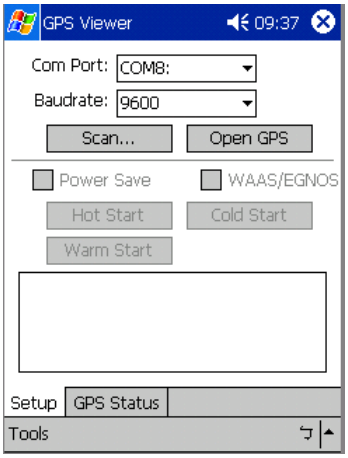


(Fig. 10)

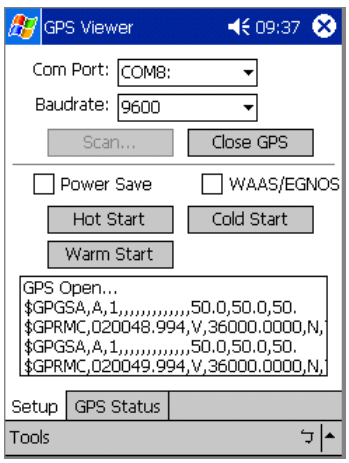
6) Setup Baud rate: 9600, then push “Scan” bottom to scan your COM Port (Example theIPAQ 3970 is the output port COM8). Select your COM Port (COM1 ~ COM10), then push “Open GPN” bottom, as Fig. 11, Fig. 12, and Fig. 13.



(Fig. 11)

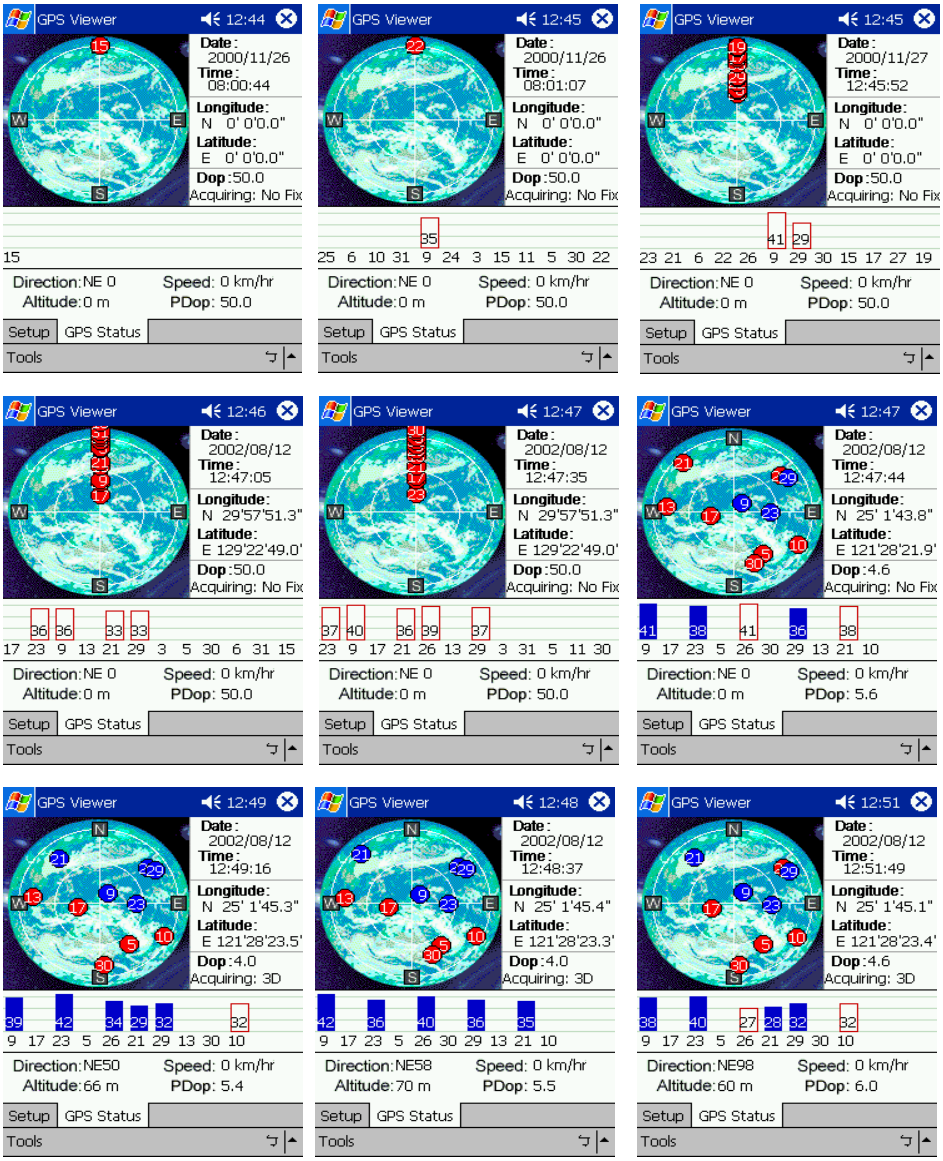


(Fig. 12)



(Fig. 13)

7) Select “GPS Status” to show the satellite diagram like below, as Fig. 14.



(Fig. 14)

6. Optional accessories

GR-230 has many accessories to satisfy customers’ requirement see table 2. After using GR-230 with the following accessories, it can transmit message with PDA, Note Book easily.

Table 2

Item	Description	Note
GR230-A1	1.5M RS232 data cable	
GR230-A2	1.5M USB data cable	
GR230-A3	Output convert to GM-210’s PDA Car charger adaptor	
GR230-B1	2M 28db MCX connector active antenna	

7. Driver Installation

You can use any GR230 accessories data cable without installing driver except GR230-A2 USB cable. The following is the steps of installation GR230-A2 USB cable.

7.1 System Requirement

CPU: IBM, Pentium, or other compatible PC.
Memory: above 16 MB
System: Windows 98/Me/2000/XP

7.2 Installation

I. Copy entire GM230 USB folder from CD to hard disk.
II. Connect GR-230-A2 USB connector to computer without GR-230 GPS receiver. While the computer automatically starts the installation program, please direct the driver to the GR230 USB folder.

7.3 Important

Verify the COM port to start using your own navigation software.

I. Click **<Start>** menu, select → **<Setting>**, then enter→ **<Controller>**
II. After entering **<Controller>**, and select **<System>**.
III. Select **<Device Manager>**.
IV. Find the **< Connector**(COM & LPT)**>** and check the Virtual COM Port, which was created by the USB driver.

Please note that the virtual COM port number might be different from every computer. Before using navigation software, please confirm the COM Port numbers created by your computer and provided by your navigation software. Otherwise, the navigating software won't receive the satellite signal, because of the un-match COM Port setting.

8. Warranty

The GR-230 is warranted to be free from defects in material and functions for a period of one year from the date of purchase. Any failure of this product within this period under normal conditions will be replaced at no charge to the customers.

- **GR-230 has built Li-battery inside, please avoid closing high temperature environment or sun shine directly for a long time.**
- **User has to return GR-230 to HOLUX if the inner Li battery has to be replaced.**

9. Trouble Shooting

Problems	Reasons	Methods
No position output but timer is counting	Weak or no GPS signal can be received at the place of GR-230	Connect an external antenna, which locate as a open space to your GR-230 and then run GPSViewer Cold start function.
	At outdoor space but GPS signal is blocked by building or car roof.	Go outdoor and run GPSViewer Cold start function to try again, or connect an external antenna to improve the poor GPS signal.
Execute fail	Bluetooth function unstable	Power On/Off GR-230. Re-Start PDA or PC and reference sec 5.2 re-install software
Can not turn on the COM port	Install GR-230 incompletely or operate the device is being used with same COM port	Install GR-230 completely or stop other device that is being used.
Can not find out GR-230	Poor connection	Re-Start PDA or PC and reference sec. 5.2 re-install software.
No Signal	No action for few minutes may cause Pocket PC entry power save mode. It will close the COM port at the same time.	Close the application and execute it again to reopen the COM port.
	Weak or no GPS signal when using GR-230 indoor	Connect an external antenna to your GR-230.

Federal Communications Commission (FCC) Statement

15.21

You are cautioned that changes or modifications not expressly approved by the part responsible for compliance could void the user's authority to operate the equipment.

15.105(b)

This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to part 15 of the FCC rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

-Reorient or relocate the receiving antenna.
-Increase the separation between the equipment and receiver.
-Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
-Consult the dealer or an experienced radio/TV technician for help.

You are cautioned that changes or modifications not expressly approved by the party responsible for compliance could void your authority to operate the equipment.

FCC RF Radiation Exposure Statement:

This Transmitter must not be co-located or operating in conjunction with any other antenna or transmitter.